

Application No.: 10/506,983
Response to Office Action of September 30, 2005
Attorney Docket: NOTAR-011US

REMARKS

This is in response to the Office Action dated September 30, 2005.

Summary of the Amendment

Upon entry of the amendment, Claims 1-10, 14, and 16 will have been amended. Further, Claim 11-13 will have been cancelled. Additionally, new Claims 17-20 will have been submitted for consideration. Therefore, Claims 1-10 and 14-20 currently remain pending.

Summary of the Office Action

In the Office Action, the Examiner objected to Claims 1 and 6 regarding the use of the term "embedded pigment" and suggested the term "encapsulated pigment" is more appropriate. The Examiner rejected Claims 11-13 under 35 U.S.C. 101 as improperly defining a process. Further, the Examiner rejected Claims 1-2 and 6-13 under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant regard as their invention. The Examiner rejected Claims 1-5, 10, and 14-16 under 35 U.S.C. 102(e) as being unpatentable over U.S. Patent No. 6,582,764 B2 issued to Fuller, et al. (hereinafter "FULLER"). Further, the Examiner rejected Claims 6-9 under 35 U.S.C. 103(a) as being unpatentable over FULLER.

In re Objection to Claims 1 and 6

In the Office Action, the Examiner objected to Claims 1 and 6 regarding the use of the term "embedded pigment" and suggested the term "encapsulated pigment" is more appropriate. In response to this objection, the Applicant has amended Claims 1 and 6 to recite "encapsulated" pigments, and therefore believes that the present objection has now been overcome.

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In re Rejection Under Section 101

In the Office Action, the Examiner rejected Claims 11-13 under 35 U.S.C. 101 as improperly defining a process. Applicant hereby cancels Claims 11-13. Therefore, Applicant believes that rejection is now moot.

Traversal of Rejection Under Section 112, Second Paragraph

Further, the Examiner rejected Claims 1-2 and 6-13 under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant regard as their invention. The Examiner provided specific bases for rejection with regard to each of these claims, which are addressed as follows.

With regard to Claim 1, the Examiner indicated that “it seems to read that the transparent material only consists of aggregate nanoparticles adhering to the surface of the labile chromophore but the language is unclear whether it is the transparent material alone, the refractory material is included or not. It is unclear what a labile chromophore is, is it an inorganic, and organic or polymer or seed material? It is also unclear what size the ‘nanoparticles’ are supposed to possess. At times nanoparticles sizes overlap with ‘particles’.” *See* Office Action.

Applicant has amended Claim 1 to recite that the labile chromophore is encapsulated by a plurality of nanoparticles which are fabricated from a refractory and transparent material. In this regard, the material utilized to fabricate the nanoparticles should preferably have both refractory and transparent properties, which contrasts to the Examiner’s apparent misunderstanding that the nanoparticles are formed from two materials, one that is refractory and one that is transparent. Further, the labile chromophore, as claimed in Claim 1, is of an inorganic material, as described in the specification. *See* Applicant’s Application, page 3, line 9 to page 4, line 1; page 7, line 19 to page 8, line 18. Finally, as indicated in the Applicant’s specification, the chromophore may be in the size range of a nanometric particle (5nm to 600nm) or as a crystal, the chromophore may be between 1 μ m to 15 μ m.

With regard to Claim 2, the Examiner argued that “Claim 2 recites the limitation ‘in which the labile chromophore is in turn in the form of a nanometric particle’. There is insufficient antecedent basis for this limitation in the claim. Claim 1 does not state that the labile chromophore is a particle or that it is nanometric. Should applicant prefer to add additional limitations to the primary claim, the proper transitional phrase and language should be used such as ‘further comprising or ‘further consisting’.” *See* Office Action.

Applicant submits that as amended, Claim 2 properly introduces a new limitation, specifically, that “the labile chromophore is the size of a nanometric particle.” Thus, Applicant respectfully requests that the rejection under Section 112 be withdrawn.

With regard to Claim 6, the Examiner indicated that “it was unclear as to what applicant is claiming because it is unclear what is being chosen to be consisting of the Markush group listed. Is it a chromophore, refractory material, transparent material or a combination of these?” *See* Office Action. In response to the Examiner’s rejection, the Applicant has amended Claim 6 to indicate that “the plurality of nanoparticles and the labile chromophore are selected according to an A’:B’ pairing, with A’ being representative of the plurality of nanoparticles and B’ being representative of the labile chromophore.” Further, Claim 6 then provides a listing of A’:B’ pairings. Applicant believes that this amendment clarifies the language of Claim 6.

The Examiner also argued that there was insufficient antecedent basis for the language of Claim 7, “preparation of the nanometric particles . . . the salts of the desired metals. . . . Claim 1 is not drawn to a nanometric particle but an embedded pigment. Furthermore, the primary claim is drawn to a different statutory category than the process claim of claim 7, therefore it is improper.” *See* Office Action. In response to the Examiner’s rejection, the Applicant has amended Claim 7 to recite method steps and to remove any dependency from Claim 1. Applicant now believes that amended Claim 7 overcomes the rejections by the Examiner and is now in condition for allowance.

With regard to Claim 8, the Examiner indicated that there was insufficient antecedent basis for the limitation “first the nanometric particles of labile chromophore are prepared. . . . The

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nanometric particles of claim 1 are part of the transparent material not the labile chromophore.” *See* Office Action. Applicant has amended Claim 8 to remedy the noted rejection, and now believes that Claim 8 is in condition for allowance.

Claim 9 was rejected as depending from claim 1 and 7 at the same time. *See* Office Action. Applicant has amended Claim 9 to remedy the noted rejection, and now believes that Claim 9 is in condition for allowance.

The Examiner indicated that Claim 10 was indefinite because it was “unclear whether the refractory oxide and the transparent oxide are to be the same or a different material chosen from the Markush group.” *See* Office Action. Applicant has amended Claim 10 to remedy the noted rejection, and now believes that Claim 10 is in condition for allowance.

Finally, Claims 11-13 were rejected as failing to point out what is included or excluded from the claim language. The Examiner argued that Claims 11-13 merely recite a use without any affirmative steps, and are therefore indefinite without any positive steps delimiting how the use is actually practiced. The Examiner also indicated that these claims will not be further treated on the merits. *See* Office Action. As noted above, the Applicant has cancelled Claims 11-13, and therefore, the rejection of these claims under Section 112, second paragraph is now moot.

Applicant hereby submits that amended Claims 1-2 and 6-10 overcome the rejections noted by the Examiner for each claim under Section 112. Claims 11-13 have been cancelled. The Applicant believes that such amendments remedy any ambiguity and that each claim now specifically points out and distinctly claims the subject matter that Applicant regards as the invention. Therefore, Applicant believes that this basis for rejection has been overcome, and respectfully requests that the Examiner withdraw the rejection of Claims 1-2 and 6-10 under Section 112.

Traversal of Rejection Under Section 102(e)

Applicant respectfully traverses the rejection of Claims 1-5, 10, and 14-16 under 35 U.S.C. 102(e) as being unpatentable over FULLER.

1. A Review of FULLER

As understood, FULLER is directed to a color effect material that is composed of a substrate platelet that is encapsulated in two or three layers. *See* FULLER, Abstract; col. 2, lines 50-53. The substrate platelet may be “mica, aluminum oxide, bismuth oxychloride, boron nitride, glass flake, iron oxide-coated mica (ICM), silicon dioxide, titanium dioxide-coated mica (TCM), copper flake, zinc flake, alloy of copper flake, alloy of zinc flake, or any encapsulatable smooth platelet.” *Id.* at col. 2, lines 40-44. The platelet has dimensions of between 5 and 250 μ m, in particular, 5 and 100 μ m. *Id.* at col. 4, lines 24-25.

As noted above the substrate platelet may be coated by two or three layers. In particular, “when the substrate is copper flake, zinc flake, alloy of copper flake or alloy of zinc flake, there is no need for . . . a first layer since it would be part of the substrate.” *Id.* at col. 2, lines 50-53. The first layer (if not the substrate itself), should be “highly reflective to light directed thereon.” *Id.* at col. 2, lines 20-21. The second layer should be a “visibly transparent second organic layer encapsulating the first layer in which the second layer consists of a low index of refraction material, typically a refractive index from 1.3 to 2.5 and more specifically between 1.4 and 2.0, that provides a variable path length for light dependent on the angle of incidence of light impinging thereon.” *Id.* at col. 2, lines 21-28 (emphasis added). Further, the “second organic encapsulating layer must provide a variable pathlength for light dependent on the angle of incidence of light impinging thereon and therefore, any low index of refraction material that is visibly transparent may be utilized.” *Id.* at col. 4, lines 49-53. Finally, the third layer should “a selectively transparent third layer to light directed thereon.” *Id.* at col. 2, lines 28-29.

With regard to the method of forming the color effect material, FULLER teaches that “a platelet material such as mica is suspended while stirring in an aqueous medium. To the suspension is added a metal precursor capable of depositing metal on the substrate by electroless deposition, along with a suitable reducing agent.” *See* FULLER, col. 5, line 64 to col. 6, line 2. After the first layer is formed, the “highly reflective metal coated substrate is filtered, washed and dried.” *Id.* at

col. 6, lines 2-4. Next, a second layer is added by use of an “aqueous deposition process . . . for the deposition of an organic polymer on the metal coated mica or other substrate. The polymer is deposited from aqueous monomers and initiators.” *Id.* at col. 6, lines 4-7. After the second layer is formed, the “organic material encapsulated metal coated platelet is filtered, washed and re-suspended in a stirred aqueous medium.” *Id.* at col. 6, lines 7-9. Finally, the third layer is formed by adding the aqueous medium “a metal precursor capable of depositing metal on the substrate by electroless deposition, along with a suitable reducing agent. The metal solution for electroless deposition is added as described above allowing for the deposition of a selectively transparent metal coating. The final particulate product is washed, dried and exhibits optical color effects as a function of viewing angle.” *Id.* at col. 6, lines 9-16.

2. Independent Claim 1

Applicant’s independent Claim 1 as amended, recites, inter alia, . . . encapsulated pigments consisting of ***a labile chromophore and a plurality of inorganic nanoparticles*** of refractory and transparent materials being adhered to a surface of the labile chromophore ***to form a shell thereabout***. Applicant submits that FULLER does not teach the aforementioned features recited in independent Claim 1.

Applicant respectfully submits that FULLER does not teach the plurality of inorganic nanoparticles as recited in Claim 1. As noted above, although FULLER teaches that the first layer may be optional (if the substrate platelet is reflective), FULLER does require a second layer formed of an organic material. FULLER does not teach or disclose that the second layer of organic material may be excluded from the color effect material. In contrast, the encapsulated pigments taught in Claim 1 do not require an organic second layer, but instead require a shell of nanoparticles that are fabricated from refractory and transparent inorganic materials. Thus, Claim 1 specifically teaches that an inorganic, not organic, material is used to form the shell of nanoparticles about the labile chromophore.

Furthermore, Applicant respectfully submits that FULLER also teaches that after the deposition of first (if necessary) and second layers (which are of different materials), a third layer (of yet another type of material) is also deposited. *See id.* at col. 6, lines 9-14. Thus, FULLER requires that the third layer be deposited after the second layer, and does not teach or suggest that the third layer may be excluded. In this regard, FULLER requires a minimum of three separate material layers (the platelet substrate, first (if necessary), second, and third layers) to fabricate the color effect materials taught therein. FULLER does not teach or suggest that the color effect material may successfully or possibly be produced using only two material layers. In contrast, Claim 1 recites that the plurality of nanoparticles are disposed on the surface of the labile chromophore to form a shell thereabout. Thus, the shell is composed of a refractory and transparent inorganic material to form a single shell, not at least two shells (i.e. first (if necessary), second, and third material layers) as required by FULLER. Furthermore, Claim 1 only requires two “material layers” (the chromophore being considered to be one layer and the shell of nanoparticles being another layer), instead of the at least three layers required by FULLER (the substrate platelet, first (if necessary), second, and third material layers).

Finally, Applicant also wishes to note that FULLER does not teach the use of a labile chromophore. FULLER teaches that the substrate platelet may be of various metals: “The substrate can be mica, aluminum oxide, bismuth oxychloride, boron nitride, glass flake, iron oxide-coated mica (ICM), silicon dioxide, titanium dioxide-coated mica (TCM), copper flake, zinc flake, alloy of copper flake, alloy of zinc flake, or any encapsulatable smooth platelet.” *See* FULLER, col. 2, lines 39-44. However, FULLER fails to teach that the substrate platelet may be any of the materials disclosed in the present application that may be used for the labile chromophore. In particular, FULLER fails to teach or disclose that a labile chromophore may be of a material such as Fe_2O_3 ; $\text{Cd}(\text{S},\text{Se})$; $\text{MoO}_x(\text{OH})_y$; and M_nWO_3 ; wherein when $x = 2$, $y = 1$, and when $x = 2.5$, $y = 0.5$, and wherein $0.1 < n < 0.95$, and wherein M is selected from the group consisting of Na, K, Li, Ca, Sr, Ba, Cu, Zn, Cd, In, Sn, and La.

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Because FULLER fails to disclose at least the above noted features of the present invention, Applicant submits that WALKER fails to disclose each and every recited feature of the instant invention, and that the Examiner has failed to establish an adequate evidentiary basis to support a rejection of anticipation under 35 U.S.C. §102(e). Therefore, Applicant submits that the Examiner's rejection of independent Claim 1 is improper and should be withdrawn. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of Claim 1 under 35 U.S.C. §102(e) and indicate that this claim is allowable over the art of record.

Further, Applicant submits that Claims 2-5, which depend from independent Claim 1 and were also rejected under 35 U.S.C. 102(e), are allowable at least for the reason that these claims depend from an allowable base claim and because these claims recite additional features that further define the invention.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of Claims 1-5 under 35 U.S.C. 102(e) and indicate that these claims are allowable over the art of record.

3. *In re Claims 10 and 14-16*

Applicant further traverses the rejection of Claims 10 and 14-16 under 35 U.S.C. 102(e), and submits that as amended, these claims are allowable over the art of record.

In particular, Applicant notes that Claim 10 has now been amended to be dependent from independent Claim 7, which recites a process for making the encapsulated pigments noted in Claim 1. Further, Claims 14 and 16 also depend from Claim 10, and have been amended for clarity. Applicant believes that these claims are allowable over FULLER and therefore respectfully request that the Examiner withdraw the rejection of Claims 10, 14, and 16 under 35 U.S.C. 102(e).

Furthermore, Applicant also notes that Claim 15 also depends from independent Claim 1, similar to Claims 2-6 mentioned above. Thus, because Claim 15 depends from an allowable base claim, the Applicant respectfully request that the Examiner withdraw the rejection of Claim 15 under

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35 U.S.C. 102(e) and indicate that such claim is allowable over the art of record.

Traversal of Rejection Under Section 103(a)

Applicant also traverses the rejection of Claims 6-9 under 35 U.S.C. 103(a) as being unpatentable over FULLER in view of the Applicant's specification.

1. The Rejection is Improper Because the Applicant's Specification Refers to Applicant's Copending Patent Application

Applicant wishes to first note that the Examiner has apparently misunderstood the Applicant's specification in asserting that the specification provides a basis for rejection. In particular, the Examiner indicated "Applicant's state in their specification that the embedded pigments according to the invention may be prepared using known processes" See Office Action. However, as explained below, Applicant respectfully submits that the rejection of Claims 6-9 should be withdrawn. In particular, the Examiner improperly bases her rejection on information from the Applicant's specification that refers to Applicant's copending PCT patent application.

The Applicant respectfully submits that the Examiner's view is a misinterpretation of the specification, which states, "The embedded pigments according to the invention may be prepared using the known processes as described in the above-mentioned patent application." The Applicant clearly indicates that the processes are described in the "above-mentioned patent application" (which is noted as "a parallel patent in the name of the present applicant," see Applicant's specification, page 2, lines 21-24; which application is U.S. Patent Application Serial No. 10/507,041, filed September 7, 2004). The "above-mentioned patent application" describes processes which may be used to fabricate the pigments. After mentioning the "above-referenced patent application," the Applicant proceeds to provide the pertinent disclosure regarding the process, and later provides considerations of embodiments of the invention disclosed in the present application. Thus, although it is possible that the Examiner may believe that such statement in the Applicant's specification

refers to “processes known in the prior art,” it is clear that the Applicant **does not** state that such processes are known in the art, but instead refers to its copending PCT patent application. Therefore, Applicant respectfully submits that the combination of FULLER with the Applicant’s specification is improper and should be withdrawn.

Furthermore, the “above-mentioned patent application,” filed on September 7, 2004 (the same filing date as the present application), was not public information at the time of filing of the present application. Thus, the “above-mentioned patent application” does not qualify as prior art. Therefore, it would be improper to combine the “above-mentioned patent application” with FULLER to support a 35 U.S.C. 103(a) rejection.

For these reasons, Applicant submits that the combination of FULLER with Applicant’s specification (and more particularly, the Applicant’s “above-mentioned patent application”) is improper and should be withdrawn.

2. *FULLER Alone Does Not Make Claims 6-9 Obvious to One of Skill in the Art*

In the case at hand, the Examiner has not provided a prior art reference which teaches or suggests *all* the claim limitations of the pending claims. In rejecting claims under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in prior art references or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Second there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.* See Litton Industrial Products, Inc. v. Solid State Systems, Corp., 755 F.2d 158, 164, 225 U.S.P.Q. 34, 38 (Fed. Cir. 1985) (“The references fail not only to expressly disclose the claimed invention as a whole, but also to suggest to one of ordinary skill in the art modifications needed to meet *all the claim limitations*”). Applicant respectfully submits that FULLER fails to

teach **all** of the features of Claims 6-9.

First, as noted above, FULLER does not teach or disclose the encapsulated pigments of Claim 1. As a result, because Claim 6 depends from Claim 1, Applicant respectfully submits that Claim 6 is also allowable over FULLER.

With regard to Claims 7-9, Applicant respectfully submits that as amended, these process claims are allowable over FULLER because FULLER does not teach or suggest the subject matter of Claims 7-9. Applicant respectfully submits that FULLER does not teach, *inter alia*, the steps of adding salts of desired metals to a known volume of alcohol to form a suspension, adding water to the suspension, and heating the suspension to a temperature higher than 150°C for furthering the hydrolysis. Additionally, FULLER does not teach that a labile chromophore being the size of a nanometric particle or in the form of a crystal, wherein the labile chromophore is prepared with the plurality of nanoparticles subsequently superimposed thereon.

As noted above, FULLER teaches that the first layer of the color effect material is formed when “a platelet material such as mica is suspended while stirring in an aqueous medium. To the suspension is added a metal precursor capable of depositing metal on the substrate by electroless deposition, along with a suitable reducing agent.” See FULLER, col. 5, line 64 to col. 6, line 2. After the first layer is formed, the “highly reflective metal coated substrate is filtered, washed and dried.” *Id.* at col. 6, lines 2-4. Next, a second layer is added by use of an “aqueous deposition process . . . for the deposition of an organic polymer on the metal coated mica or other substrate. The polymer is deposited from aqueous monomers and initiators.” *Id.* at col. 6, lines 4-7. After the second layer is formed, the “organic material encapsulated metal coated platelet is filtered, washed and re-suspended in a stirred aqueous medium.” *Id.* at col. 6, lines 7-9. Finally, the third layer is formed by adding the aqueous medium “a metal precursor capable of depositing metal on the substrate by electroless deposition, along with a suitable reducing agent. The metal solution for electroless deposition is added as described above allowing for the deposition of a selectively transparent metal coating. The final particulate product is washed, dried and exhibits optical color effects as a function of viewing

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angle.” *Id.* at col. 6, lines 9-16. Furthermore, FULLER also provides teachings related to the preparation of Ag/Polydivinylbenzene/Ag CEM in Example 2. *See id.* at col. 8-9.

Notably, FULLER is devoid of any teaching or disclosure that makes obvious steps of Claim 7-9. With regard to Claim 7, FULLER does not teach or disclose the addition of salts of desired metals to a known volume of alcohol to form a suspension, adding water to the suspension, and heating the suspension to a temperature higher than 150°C for furthering hydrolysis thereof. Additionally, FULLER does not teach that a labile chromophore being the size of a nanometric particle or in the form of a crystal, wherein the labile chromophore is prepared with the plurality of nanoparticles subsequently superimposed thereon, as taught in Claims 8-9.

Therefore, Applicant respectfully submits that FULLER fails to teach **all** of the features of Claims 7-9. Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejections of independent Claims 7-9 under 35 U.S.C. § 103(a) and indicate that these claims are allowable over the art of record.

New Claims 17-20

Applicant hereby submits new Claims 17-20, which depend directly or indirectly from Claim 7. Applicant believes that such claims further define and describe that which the Applicant regards as the invention. Further, Applicant believes that these claims are allowable at least for the reason that they depend from an allowable base claim. Therefore, Applicant respectfully requests that the Examiner indicate allowance of Claims 17-20.

Application is Allowable

Applicant respectfully submits that each and every pending claim of the present invention meets the requirements for patentability and respectfully requests the Examiner to indicate allowance of each and every pending claim of the present invention.

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CONCLUSION

In view of the foregoing, it is submitted that none of the references of record, when considered individually or in any proper combination thereof, anticipate or render obvious the Applicant's invention as recited in each of Claims 1-10 and 14-20. The applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.


Further, any amendments to the claims which have been made in this response and which have not been specifically noted to overcome a rejection based upon prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

If any additional fees are required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: 3/30/06

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